

Appl. No. 10/661,793
Amdt. dated 12/05/2006
Response to Office Action of 09/05/2006

DEC 05 2006 Attorney Docket No.: TS01-1037
N1085-90149

REMARKS/ARGUMENTS

Claims 8-17 were previously pending in this application. Claims 12-14 have been allowed and claims 8-11 and 15-17 rejected. Claims 8, 15 and 16 are hereby amended. Applicants respectfully request re-examination, reconsideration and allowance of each of pending claims 8-11 and 15-17 in addition to previously-allowed claims 12-14.

Applicants and their undersigned representative thank the Examiner for the detailed analysis, comments and figures from the referenced documents that were embedded in the Office Action and which proved very helpful.

Applicants also point out that an Information Disclosure Statement is being filed herewith.

I. Allowable Subject Matter

Applicants further thank the Examiner for indicating, on the bottom of page 9 of the Office Action, that claims 12-14 have been allowed.

II. Rejection of Claims 8-11 Under 35 U.S.C. § 102(e)

On page 2 of the Office Action, claims 8-11 and 15-17 were rejected under 35 U.S.C. § 102(e) as being anticipated by Sedigh et al. (U.S. Pat. No. 6,893,974), hereinafter "Sedigh". Applicants respectfully submit that the present claim rejections based on the Sedigh reference are overcome for reasons set forth below.

Independent claims 8, 15 and 16 have each been amended. Each of independent claims 8, 15 and 16 recite:

said feedback mechanism communicating with said means for creating an opening through a layer of etch resist material to control said critical dimension measurement of said opening.

Appl. No. 10/661,793
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Each of the independent claims now more clearly point out that the opening being controlled is an after develop opening as it extends through the etch resist layer and that the feedback mechanism, part of the means for obtaining desirable critical dimension measurements of the after develop openings (openings created through the layer of etch resist material), communicates with the means for creating the opening and controls the critical dimension, i.e., the ADI-CD's, of the opening. Sedigh does not do this. As pointed out in Applicants' previous response filed June 15, 2006, Sedigh merely accepts whatever "process pre-etch values", i.e., ADI-CDs, are received. Critical dimension measurements of openings formed through etched resist material after develop and prior to etching are commonly referred to as ADI-CDs (after develop inspect CDs). Referring to FIG. 9, Sedigh, based on whether the ADI-CDs values are within a target value, either:

- A) etches wafers without adjustment of etch parameters 96 (yes); or
- B) adjusts one or more etch parameters 98 (no),

Sedigh makes no provision for actually obtaining ADI critical dimension measurements of the opening through the resist material that are within design specifications, much less CONTROLLING the critical dimensions of the opening formed through the etch resist layer, i.e., the ADI-CDs, as does the claimed invention as reflected in independent claims 8, 15 and 16, which are therefore distinguished from Sedigh.

Sedigh, in contrast, includes a CPU that adjusts the etch recipe if necessary based on the ADI-CD measurements, to insure that post-etch critical dimensions are within design specification. Sedigh states, in column 24, lines 20-24:

As such, CPU 88 is adapted to adjust the etching parameters prior to etching the semiconductor topography if the statistical result of the pre-etch values is substantially different than the target value (referring to the pre-etch values).

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FIG. 9 of Sedigh does not include any feedback mechanism for assuring that ADI-CDs are within specification limits. In particular, Sedigh does not include any feedback mechanism pointing back to step 90: measure pre-etch values; or to step 92: process pre-etch values. Nothing in Sedigh suggests any feedback to either of these steps. Rather, Sedigh uses the ADI-CD data as an input parameter and customizes the etching process (i.e. feed forward) in view of the received and uncontrolled ADI-CD data. Sedigh does not attempt to control the after develop CD measurements. This is quite distinguished from using a feedback mechanism to control the process for forming the ADI-CDs to insure that the ADI-CDs are in design specification limits.

- 10 Independent claims 8, 15 and 16 are therefore distinguished from Sedigh. The rejection of these claims under 35 USC § 102(e) as being anticipated by Sedigh should therefore be withdrawn. Claims 9-11 depend from claim 8 and claim 17 depends from claim 16 and are similarly distinguished from Sedigh. The rejection of claims 9-11 and 17 under 35 USC § 102(e) as being anticipated by Sedigh, should also be withdrawn.
- 15 Claims 8-11 and 15-17 are in allowable form.

- The Singh et al. reference disclosed by Applicants (USPN 6,561,706) is limited to monitoring and measuring a latent image form in a resist layer after exposure but prior to develop. Singh et al. is limited to providing feedback information to the exposure operation or feed forward operation to develop and bake operations. Singh et al. is therefore NOT directed to monitoring critical dimensions of openings formed through an etch resist material and controlling anything based on an analysis of measurement of such openings, as in the claimed invention.
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CONCLUSION

DEC 05 2006

Based on the foregoing, each of claims 8-17 is in allowable form and the application is therefore in condition for allowance, which action is respectfully and expeditiously requested.

- 5 Applicants respectfully request entry of the claim amendments because the claim amendments rendered the application allowable, as discussed supra.

The Assistant Commissioner for Patents is hereby authorized to charge any additional fees or credit any excess payment that may be associated with this communication to Deposit Account 04-1679.

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Respectfully submitted,

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